

PATENT ABSTRACTS OF JAPAN

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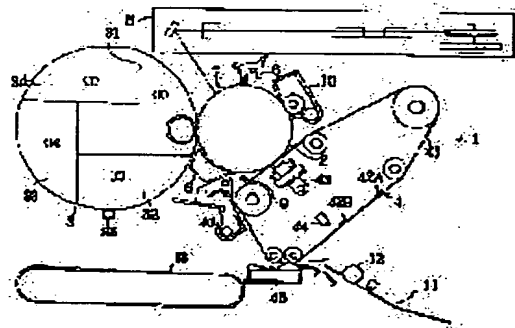
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(54) IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To increase the number of printing sheets per unit time by immediately transferring a toner image transferred on an intermediate transfer body on a transfer paper.

SOLUTION: The transfer paper is supplied when a second reference mark 42B detected first by a mark sensor 44 after one or plural sheets of color images are formed on the intermediate transfer belt 41 with the detecting time of a reference mark 42A as a reference. Then, the color images are immediately secondarily transferred on the transfer paper without excessively rotating the belt 4 after they are formed on the belt 41.



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CLAIMS

[Claim(s)]

[Claim 1] Based on detection of the reference mark in which the color picture by which sequential formation was carried out was prepared by toner image support, one sheet or the color picture for two or more sheets is imprinted with the alignment of each color at toner image support to a photo conductor. One sheet or the color picture for two or more sheets imprinted by toner image support is imprinted to a transfer paper, respectively. Image formation equipment which is image formation equipment which fixes to a transfer paper the color picture imprinted by the transfer paper, and is characterized by defining transfer paper feeding timing based on detection of the 2nd reference mark prepared in a different location from the reference mark for the alignment of the toner image of the above-mentioned toner image support.

[Claim 2] Image formation equipment according to claim 1 defined with the distance to the location which imprints the toner image imprinted by toner image support from feed *****--** which the 2nd reference mark of the above is prepared ahead of the hand of cut of toner image support from the reference mark for the alignment of a toner image, and dashes the tip of a transfer paper and changes spacing of the reference mark for the alignment of a toner image, and the 2nd reference mark into a standby condition to a transfer paper.

[Claim 3] Based on detection of the reference mark in which the color picture by which sequential formation was carried out was prepared by toner image support, one sheet or the color picture for two or more sheets is imprinted with the alignment of each color at toner image support to a photo conductor. One sheet or the color picture for two or more sheets imprinted by toner image support is imprinted to a transfer paper, respectively. It is image formation equipment which fixes to a transfer paper the color picture imprinted by the transfer paper. The reference mark of toner image support is detected in a different location from the 1st mark sensor which detects the reference mark of the above-mentioned toner image support, and outputs the reference signal of the alignment of the toner image of toner image support. Image formation equipment characterized by forming the 2nd mark sensor which defines transfer paper feeding timing.

[Claim 4] Image formation equipment according to claim 2 defined with the distance to the location which imprints the toner image imprinted by toner image support from feed *****--** which dashes the tip of a transfer paper and changes spacing of the 1st mark sensor of the above, and the 2nd mark sensor into a standby condition to a transfer paper.

[Claim 5] Image formation equipment according to claim 1, 2, 3, or 4 which has the mode which switches the image formed in the time of imprinting the image formed in the photo conductor in the field passing speed of the above-mentioned toner image support to toner image support, and toner image support in the time of imprinting to a transfer paper.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to improvement in image formation equipments, such as a color copying machine and a color printer, especially printing efficiency.

[0002]

[Description of the Prior Art] For example, many heating values are farther [the heating value for the toner image imprinted to the thick transfer paper of an OHP form, a postcard, etc. by the color printer etc. being established / than the usual transfer paper] needed. When an image is fixed to pasteboard, such as this OHP form, postcard, etc., in order to make it fixing effectiveness not fall For example, the rate when slowing down the rate of a middle imprint object so that it may become the rate of an anchorage device and the almost same rate, and imprinting a toner image to a transfer paper, after the toner image of the color for the page 1 of a transfer paper is imprinted by the middle imprint object as shown in JP,4-67174,A is doubled with the rate of an anchorage device. He is trying to secure the heating value when a color picture being established with a small anchorage device.

[0003] Moreover, with the image formation equipment shown in JP,6-11977,A, the rate of the middle imprint object when being established with the time of imprinting a toner image is made later than the rate in other processes in the case of image formation, and the high recording rate is held.

[0004] However, in making the rate of a middle imprint object late, before imprinting to a transfer paper after imprinting a toner image on a middle imprint object as mentioned above, if timing which imprints a toner image to a transfer paper is made immobilization when a mechanical difference is in the rate change time amount of the motor which drives a middle imprint object for every equipment, or the migration length at the time of rate change, the image tip location in a transfer paper will become unstable. In order to cancel that the image tip location in this transfer paper becomes unstable, it is necessary to adjust the timing which imprints a toner image to a transfer paper for every equipment, and assembly and an adjustment man day increase. Moreover, the timing which imprints a toner image to a transfer paper not only adjusts the timing which may carry out aging and imprints a toner image for every equipment at a transfer paper in such a case, but whenever timing changes, it must readjust it.

[0005] In order to solve such a problem, as shown in JP,9-185271,A After imprinting the toner image to the middle imprint object, when the rate of a middle imprint object is changed, He determines the timing which imprints the toner image imprinted on the middle imprint object on the basis of detection of the mark for [which was prepared in the middle imprint object] alignment to a transfer paper, and is trying to lose the effect to the image by the rate change time amount of the motor which drives a middle imprint object, or the migration length at the time of rate change.

[0006]

[Problem(s) to be Solved by the Invention] After imprinting the toner image to the middle imprint object as mentioned above, when the rate of a middle imprint object is changed, If the timing which imprints the toner image imprinted on the middle imprint object on the basis of detection

of the mark for [which was prepared in the middle imprint object] alignment to a transfer paper is determined After imprinting a toner image on a middle imprint object from a photo conductor, before imprinting the toner image imprinted by the middle imprint object to a transfer paper, it is necessary to make an excess rotate a middle imprint object once, and to detect the mark for the alignment of a middle imprint object. Thus, in order to rotate a middle imprint object too much, the printing number of sheets per unit time amount will fall. Moreover, if a middle imprint object is rotated too much, contact to the toner image and photo conductor which were imprinted on the middle imprint object increases, and image degradation may be caused.

[0007] furthermore — although he is trying to switch the rate of a middle imprint object after the back end of a toner image is imprinted by the middle imprint object from a photo conductor — the timing — after changing the linear velocity of a middle imprint object depending on how, time amount will be taken to mark detection, and the printing number of sheets per unit time amount will fall as a result. Moreover, although the toner image of two regions is imprinted on a middle imprint object and improvement in the printing number of sheets per unit time amount is aimed at when the size of an image is smaller than criteria size, for example, A4 size Even if it changes a rate immediately after the image back end of the 2nd side was imprinted by the middle imprint object The image tip of the 1st side will need to pass through the imprint location to a transfer paper on a layout, it will be necessary to rotate a middle imprint object by about 1 rotation the rate after a rate switch, and the printing number of sheets per unit time amount will fall [the part].

[0008] This invention cancels this demerit, and the degree of **, after switching, it aims a middle imprint object at obtaining the image formation equipment which can imprint the toner image immediately imprinted by the middle imprint object to a transfer paper, and can improve the printing number of sheets per unit time amount.

[0009]

[Means for Solving the Problem] The image formation equipment concerning this invention imprints one sheet or the color picture for two or more sheets with the alignment of each color at toner image support based on detection of the reference mark in which the color picture by which sequential formation was carried out was prepared by toner image support to a photo conductor. One sheet or the color picture for two or more sheets imprinted by toner image support is imprinted to a transfer paper, respectively. It is image formation equipment which fixes to a transfer paper the color picture imprinted by the transfer paper, and is characterized by defining transfer paper feeding timing based on detection of the 2nd reference mark prepared in a different location from the reference mark for the alignment of the toner image of the above-mentioned toner image support.

[0010] It is good to set with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which the 2nd reference mark of the above is prepared ahead of the hand of cut of toner image support from the reference mark for the alignment of a toner image, and dashes the tip of a transfer paper and changes spacing of the reference mark for the alignment of a toner image, and the 2nd reference mark into a standby condition to a transfer paper.

[0011] Moreover, other image formation equipments concerning this invention imprint one sheet or the color picture for two or more sheets with the alignment of each color at toner image support based on detection of the reference mark in which the color picture by which sequential formation was carried out was prepared by toner image support to a photo conductor. One sheet or the color picture for two or more sheets imprinted by toner image support is imprinted to a transfer paper, respectively. It is image formation equipment which fixes to a transfer paper the color picture imprinted by the transfer paper. It is characterized by forming the 2nd mark sensor which detects the reference mark of toner image support in a different location from the 1st mark sensor which detects the reference mark of the above-mentioned toner image support, and outputs the reference signal of the alignment of the toner image of toner image support, and sets transfer paper feeding timing to it.

[0012] It is good to set with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which dashes the tip of a transfer

paper and changes spacing of the 1st mark sensor of the above, and the 2nd mark sensor into a standby condition to a transfer paper.

[0013] Moreover, the above-mentioned image formation equipment has the mode which switches the image formed in the time of imprinting the image formed in the photo conductor in the field passing speed of the above-mentioned toner image support to toner image support, and toner image support in the time of imprinting to a transfer paper.

[0014]

[Embodiment of the Invention] The image formation equipment of this invention fixes to a transfer paper the color picture which imprinted 1 or the color picture for two or more sheets which imprinted 1 or the color picture for two or more sheets to the middle imprint belt with the alignment of each color based on the reference mark in which the color picture by which sequential formation was carried out was prepared by the photo conductor at the middle imprint belt, and was imprinted by the middle imprint belt to the transfer paper, respectively, and was imprinted by the transfer paper. To a middle imprint belt, it has the 2nd reference mark prepared ahead of the hand of cut of a middle imprint belt from the reference mark which carries out alignment of each color. It becomes the criteria of the transfer paper feeding timing for carrying out alignment of the tip of the toner image when imprinting the toner image with which the time of a mark sensor detecting this 2nd reference mark was imprinted by the middle imprint belt to a transfer paper, and a transfer paper. Spacing of the reference mark which carries out alignment of each color, and the 2nd reference mark is defined according to the distance to the location which imprints the toner image imprinted by the middle imprint belt from feed *****-** which dashes the tip of a transfer paper and is changed into a standby condition to a transfer paper.

[0015] And after forming 1 or the color picture for two or more sheets in a middle imprint belt, based on detection of the 2nd reference mark first detected with a mark sensor, paper is fed to a transfer paper, and the secondary color picture formed in the middle imprint belt is imprinted to a transfer paper. Thus, after forming a color picture in a middle imprint belt, the secondary color picture is immediately imprinted to a transfer paper, without rotating a middle imprint belt too much.

[0016]

[Example] Drawing 1 is the block diagram of one example of this invention. As shown in drawing, the printer section 1 which performs image formation and imprint actuation of image formation equipment has a photo conductor 2, the revolver unit 3, the imprint unit 4, and the write-in unit 5. The electric discharge lamp 6, the electrification charger 7, the revolver unit 3, the toner coating weight sensor 8, the electric discharge lamp 9 before an imprint, the imprint unit 4, and drum chestnut-NINGUBU 10 are formed along the hand of cut of a photo conductor 2. The revolver unit 3 has black (K), cyanogen (C), a Magenta (M), and the yellow development counters 31, 32, 33, and 34 and the yellow (Y) revolver home-position sensor 35 of each color. The imprint unit 4 has the middle imprint belt 41 and the belt imprint charger 43 which are wound around two or more rollers about; and have two reference marks 42A and 42B, the mark sensor 44 which reads reference marks 42A and 42B, the paper imprint charger 45, and the belt chestnut-NINGU section 46. The middle imprint belt 41 has the perimeter twice the die length of the photo conductor 2 which applied two sheets and transfer paper spacing of A4 horizontal size, and can form the image of two screens now in the middle imprint belt 41 in the same color by two rotations of a photo conductor 2. Reference mark 42A prepared in this middle imprint belt 41 becomes the criteria when imprinting in piles the toner image of each color formed in the photo conductor 2 to the middle imprint belt 41. Reference mark 42B prepared ahead of the hand of cut of the middle imprint belt 41 from reference mark 42A becomes the criteria of the transfer paper feeding timing for carrying out alignment of the tip of a toner image and a transfer paper, when imprinting the toner image imprinted by the middle imprint belt 41 to a transfer paper. Spacing of this reference mark 42A and reference mark 42B is defined according to the distance to the location which imprints the toner image imprinted by the middle imprint belt 41 to a transfer paper with the paper imprint charger 45 from feed *****-** 12 which dashes the tip of a transfer paper and is changed into a standby condition.

[0017] As shown in the block diagram of drawing 2, in the control section of image formation equipment, it has the printer control section 100, the scanner control section 200, the feed control section 300, and the sorter control section 400, and image formation imprint processing, image reading processing, feed processing, manuscript conveyance processing, and classification processing are performed by control of the system control section 500 to it.

[0018] The printer control section 100 has the IO controller 107 which writes in with CPU101, ROM102 and RAM103, and the serial communication controller 104, and performs a control unit 105, the laser light source control unit 106, and input/output control. CPU101 the drum motor 111 which drives the Maine motor 110 and photo conductor 2 which drive a paper conveyance system according to the control program memorized beforehand to ROM102, and the middle imprint belt 41, the development motor 112 which drives a development sleeve, and the revolver unit 3 The revolver motor 113 to drive, the supply motor 114 which supplies a toner, the fixing unit 160, and a power supply section 170 are made to drive. The revolver home-position sensor circuit 151 connected to the mark sensor circuit 150 connected to the mark sensor 44, or the revolver home-position sensor 35, the electrometer circuit 180 which measures the potential of the photo conductor 2 charged with the electrification charger 7 And actuation of the printer section 1 whole is controlled by the signal from the toner coating weight sensor circuit 181 connected to the toner coating weight sensor 8. The serial communication controller 104 controls transfer of control information or image data between the scanner control section 200, the feed control section 300, the sorter control section 400, and the system control section 500. It connects with the laser light source control unit 106 and the polygon motor 115, and the write-in control unit 105 performs exposure control of image data.

[0019] The image formation equipment formed as mentioned above explains the actuation when forming the full color image of the manuscript of one sheet of for example, B4 size or A4 size in transfer papers, such as pasteboard, with reference to the timing diagram of drawing 3.

[0020] If an image formation cycle is started, CPU101 of the printer control section 100 will turn ON the electric discharge lamp 6, will rotate the drum motor 111, will rotate a photo conductor 2 counterclockwise, and will rotate the middle imprint belt 41 clockwise with the same linear velocity V1 as a photo conductor 2. Photo conductor 2 front face discharged by rotation of this photo conductor 2 with the electric discharge lamp 6 is uniformly charged with the electrification charger 7. On the other hand, if the middle imprint belt 41 rotates and a mark sensor 44 detects 2nd reference mark 42A succeeding to the first reference mark 42B, the scanning initiation command of the black (K) image of one amorous glance will be sent to the scanner control section 200. The scanner control section 200 reads the image of the manuscript set to the scanner, and sends it to the write-in unit 5. The write-in unit 5 exposes a photo conductor 2 according to the black image K1 of the manuscript read by the scanner control section 200, and forms the electrostatic latent image of the black image K1. The electrostatic latent image of the black image K1 formed in the photo conductor 2 is visualized in the revolver unit 3. The 1st order of this visualized black image K1 is imprinted with the belt imprint charger 43 to the middle imprint belt 41 to the timing on the basis of detection of reference mark 42A of the middle imprint belt 41 by the mark sensor 44. After the secondary imprint of the black image K1 of one amorous glance is completed, the revolver unit 3 is rotated by the development motor 112, and the development counter 32 of cyanogen (C) is contacted to a photo conductor 2. Then, the primary cyanogen image C1 which formed and formed the cyanogen image C1 in the photo conductor 2 like the above is imprinted to the middle imprint belt 41 to the timing on the basis of reference mark 42A detection of the middle imprint belt 41, and the black image K1 of one amorous glance and the cyanogen image C1 of two amorous glance are piled up. This image formation and a primary imprint are repeated for every image of a Magenta (M) and yellow (Y), and as shown in drawing 4, a color picture FC1 is formed in the middle imprint belt 41.

[0021] If a color picture FC1 disappears from the point of contact of a photo conductor 2 and the middle imprint belt 41 as a primary imprint ends the yellow image Y1 which hits the last color at this image formation and primary imprint processes to the middle imprint belt 41 and it is shown in drawing 4, CPU101 will slow down the rotational speed of the drum motor 111, and will make linear velocity V1 of a photo conductor 2 and the middle imprint belt 41 one half of the

linear velocity V2. If moderation of the rotational speed of the drum motor 111 is started, after fixed time amount, the middle imprint belt 41 will become linear velocity V2, and will be stabilized. If a mark sensor 44 detects reference mark 42B of the beginning of the middle imprint belt 41 after slowing down the drive rate of the middle imprint belt 41 to linear velocity V2 When CPU101 detects reference mark 42B Timing is taken and the feed resist roller 12 is rotated so that the tip of the transfer paper which sets on criteria, is sent from the color picture FC1 and the feed section 11 on the middle imprint belt 41, dashes a tip against feed *****--** 12, and is in the standby condition may suit. A transfer paper Delivery, A transfer paper is made to imprint the secondary color picture FC1. The transfer paper which imprinted the color picture FC1 is conveyed by the fixing unit 160 with the conveyance means 13, and it is fixed to it.

[0022] Thus, since paper is fed to a transfer paper based on detection of reference mark 42B first detected with a mark sensor 44 after forming the color picture FC1 of a manuscript in the middle imprint belt 41 and the secondary color picture FC1 is imprinted, after forming the color picture FC1 of the manuscript of the 1st sheet in the middle imprint belt 41, the secondary color picture FC1 can be immediately imprinted to a transfer paper, without rotating the middle imprint belt 41 too much.

[0023] When a secondary imprint is completed, the toner which the belt cleaning section 46 was contacted to the middle imprint belt 41, and carried out the residue to the middle imprint belt 41 is removed, and it goes into the image formation of the following manuscript, and primary imprint processes.

[0024] Next, the actuation when forming the full color image of the manuscript for two sheets of A4 horizontal size in a transfer paper, for example is explained with reference to the timing diagram of drawing 5.

[0025] An image formation cycle is started, and if the middle imprint belt 41 rotates and a mark sensor 44 detects 2nd reference mark 42A succeeding to the first reference mark 42B, the scanning initiation command of the black (K) image of one amorous glance will be sent to the scanner control section 200. The scanner control section 200 reads the image of the 1st sheet of the manuscript of two sheets set to the scanner, and sends it to the write-in unit 5. The write-in unit 5 exposes a photo conductor 2 according to the black image K1 of the manuscript of the 1st sheet read by the scanner control section 200, and forms the electrostatic latent image of the black image K1. The electrostatic latent image of the black image K1 formed in the photo conductor 2 is visualized in the revolver unit 3. The 1st order of this visualized black image K1 is imprinted with the belt imprint charger 43 to the middle imprint belt 41 to the timing on the basis of detection of reference mark 42A of the middle imprint belt 41 by the mark sensor 44. After the read of the manuscript of the 1st sheet is completed, only the time amount corresponding to the time interval which conveys the transfer paper of the manuscript of the 1st sheet and the transfer paper of the manuscript of the 2nd sheet stands by by SUKUYANAHO-MUPOJISHON until it carries out the return of the scanner at high speed and the manuscript of the 2nd sheet carries out reading initiation. Then, the primary black image K2 which formed the black image K2 of the manuscript of the 2nd sheet in the photo conductor 2 like the above, and was formed in the photo conductor 2 is imprinted to the field after the field which imprinted the black image K1 of the middle imprint belt 41. After the secondary imprint of the black images K1 and K2 of one amorous glance is completed, the revolver unit 3 is rotated by the development motor 112, and the development counter 32 of cyanogen (C) is contacted to a photo conductor 2. Then, the primary cyanogen image C1 which formed and formed the cyanogen image C1 of the manuscript of the 1st sheet in the photo conductor 2 like the above is imprinted to the middle imprint belt 41 to the timing on the basis of reference mark 42A detection of the middle imprint belt 41, and the black image K1 of one amorous glance and the cyanogen image C1 of two amorous glance are piled up. Then, the cyanogen image C2 of the manuscript of the 2nd sheet is formed in a photo conductor 2, and the primary formed cyanogen image C2 is imprinted to the middle imprint belt 41, and is laid on top of it with the black image K2. This image formation and a primary imprint are repeated for every image of a Magenta (M) and yellow (Y), as shown in drawing 6, after forming the color picture FC1 of the manuscript of the 1st sheet in the middle imprint belt 41, the yellow image Y2 of the manuscript of the 2nd sheet which hits the last color

at image formation and primary imprint processes is imprinted, and the color picture FC2 of the manuscript of the 2nd sheet is formed.

[0026] If a primary imprint ends the yellow image Y2 of the manuscript of the 2nd sheet which hits the last color at this image formation and primary imprint processes to the middle imprint belt 31 and it goes into secondary imprint processes After CPU101 slows down the rotational speed of the drum motor 111 and slows down the linear velocity V1 of a photo conductor 2 and the middle imprint belt 41 to one half of the linear velocity V2 When a mark sensor 44 detects reference mark 42B of the beginning of the middle imprint belt 41, timing is taken on the basis of the time of detecting reference mark 42B, the feed resist roller 12 is rotated, and delivery and a transfer paper are made to imprint the secondary color picture FC1 for a transfer paper. The fixing unit 160 is conveyed and fixed to the transfer paper which imprinted the color picture FC1 with the conveyance means 13. If the secondary color picture FC1 is imprinted, the secondary color picture FC2 of the manuscript of the 2nd sheet will be succeedingly imprinted to a transfer paper, and it will be established. Moreover, when a secondary imprint is completed, the toner which the belt cleaning section 46 was contacted to the middle imprint belt 41, and carried out the residue to the middle imprint belt 41 is removed, and it goes into the image formation of the manuscript of the 3rd sheet, and the manuscript of the 4th sheet, and primary imprint processes.

[0027] Thus, since the color picture of the manuscript of the 2nd sheet is succeedingly formed in the middle imprint belt 41 at the color picture FC1 of the manuscript of the 1st sheet, the print speed per unit time amount can be improved.

[0028] The above-mentioned example forms two reference marks 42A and 42B in the middle imprint belt 41. The toner image of each color formed in the photo conductor 2 in detection of one reference mark 42A is made into the criteria when imprinting in piles to the middle imprint belt 41. Although the case where the toner image imprinted by the middle imprint belt 41 in detection of reference mark 42B of another side was made into the criteria of the transfer paper feeding timing when imprinting to a transfer paper was explained You may make it two mark sensors 44A and 44B detect one reference mark 42 prepared in the middle imprint belt 41, as shown in drawing 7 . In this case, what is necessary is to make the toner image of each color formed in the photo conductor 2 in the time of detecting a reference mark 42 by mark sensor 44A into the criteria when imprinting in piles to the middle imprint belt 41, and just to make the toner image imprinted by the middle imprint belt 41 in the time of detecting a reference mark 42 by mark sensor 44B into the criteria of the transfer paper feeding timing when imprinting to a transfer paper, as shown in the timing diagram of drawing 8 .

[0029] Moreover, although the case where slowed down the linear velocity V1 of the middle imprint belt 41 to one half of the linear velocity V2, and a toner image was imprinted to a transfer paper was explained after imprinting the toner image to the middle imprint belt 41 in order that the above-mentioned example might ***** an image to transfer papers, such as pasteboard The transfer paper of a regular paper is used, and when imprinting a toner image to a transfer paper without slowing down the linear velocity V1 of the middle imprint belt 41, after imprinting a toner image to the middle imprint belt 41, the print speed per unit time amount can be improved similarly.

[0030]

[Effect of the Invention] As explained above, this invention After imprinting the toner image formed in the photo conductor to toner image support on the basis of detection of the reference mark for the alignment of the toner image of toner image support and forming a color picture, based on detection of the 2nd reference mark detected first, paper is fed to a transfer paper with a mark sensor. Since the secondary color picture formed in toner image support was imprinted to the transfer paper After forming a color picture in toner image support, the secondary color picture can be immediately imprinted to a transfer paper, without rotating toner image support too much, and the print speed per unit time amount can be improved.

[0031] moreover, since it is alike immediately after forming a color picture in toner image support, and the secondary color picture is imprinted to a transfer paper, reverse transcription of the toner image from toner image support to a photo conductor can be lessened, and a good

image can be formed.

[0032] Moreover, the 2nd reference mark is prepared ahead of the hand of cut of toner image support from the reference mark for the alignment of a toner image. By setting with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which dashes the tip of a transfer paper and changes spacing of the reference mark for the alignment of a toner image, and the 2nd reference mark into a standby condition to a transfer paper After forming a color picture in a middle imprint belt, while being able to imprint the secondary color picture to a transfer paper immediately, transfer paper feeding timing can be set up easily.

[0033] Furthermore, control when imprinting the color picture formed in the time of imprinting a toner image to toner image support and toner image support to a transfer paper can be simplified more by forming the 2nd mark sensor which detects the reference mark of toner image support in a different location from the 1st mark sensor which detects the reference mark of toner image support and outputs the reference signal of the alignment of the toner image of toner image support, and sets transfer paper feeding timing to it.

[0034] Moreover, transfer paper feeding timing can be easily set up by setting with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which dashes the tip of a transfer paper and changes spacing of the 1st mark sensor and the 2nd mark sensor into a standby condition to a transfer paper.

[0035] Furthermore, by having the mode which switches the image formed in the time of imprinting the image formed in the photo conductor in the field passing speed of toner image support to toner image support, and toner image support in the time of imprinting to a transfer paper, also when imprinting to special transfer papers, such as pasteboard, a good image can be formed quickly.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to improvement in image formation equipments, such as a color copying machine and a color printer, especially printing efficiency.

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PRIOR ART

[Description of the Prior Art] For example, many heating values are farther [the heating value for the toner image imprinted to the thick transfer paper of an OHP form, a postcard, etc. by the color printer etc. being established / than the usual transfer paper] needed. When an image is fixed to pasteboard, such as this OHP form, postcard, etc., in order to make it fixing effectiveness not fall, For example, after the toner image of the color for the page 1 of a transfer paper is imprinted by the middle imprint object as shown in JP,4-67174,A, the rate when slowing down the rate of a middle imprint object so that it may become the rate of an anchorage device and the almost same rate, and imprinting a toner image to a transfer paper is doubled with the rate of an anchorage device, and he is trying to secure the heating value when a color picture being established with a small anchorage device.

[0003] Moreover, with the image formation equipment shown in JP,6-11977,A, the rate of the middle imprint object when being established with the time of imprinting a toner image is made later than the rate in other processes in the case of image formation, and the high recording rate is held.

[0004] However, in making the rate of a middle imprint object late, before imprinting to a transfer paper after imprinting a toner image on a middle imprint object as mentioned above, if timing which imprints a toner image to a transfer paper is made immobilization when a mechanical difference is in the rate change time amount of the motor which drives a middle imprint object for every equipment, or the migration length at the time of rate change, the image tip location in a transfer paper will become unstable. In order to cancel that the image tip location in this transfer paper becomes unstable, it is necessary to adjust the timing which imprints a toner image to a transfer paper for every equipment, and assembly and an adjustment man day increase. Moreover, the timing which imprints a toner image to a transfer paper not only adjusts the timing which may carry out aging and imprints a toner image for every equipment at a transfer paper in such a case, but whenever timing changes, it must readjust it.

[0005] In order to solve such a problem, it is shown in JP,9-185271,A, After imprinting a toner image to a middle imprint object, when the rate of a middle imprint object changes, he determines the timing which imprints the toner image which imprinted on the middle imprint object on the basis of detection of the mark for [which was prepared in the middle imprint object] alignment to a transfer paper, and he is trying to lose the effect to the image by the rate change time amount of the motor which drives a middle imprint object, or the migration length at the time of rate change.

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EFFECT OF THE INVENTION

[Effect of the Invention] This invention should be based the toner image formed in the photo conductor on detection of the reference mark for the alignment of the toner image of toner image support as explained above. After imprinting to toner image support and forming a color picture, based on detection of the 2nd reference mark detected first, paper is fed to a transfer paper with a mark sensor. Since the secondary color picture formed in toner image support was imprinted to the transfer paper After forming a color picture in toner image support, the secondary color picture can be immediately imprinted to a transfer paper, without rotating toner image support too much, and the print speed per unit time amount can be improved.

[0031] moreover, since it is alike immediately after forming a color picture in toner image support, and the secondary color picture is imprinted to a transfer paper, reverse transcription of the toner image from toner image support to a photo conductor can be lessened, and a good image can be formed.

[0032] Moreover, the 2nd reference mark is prepared ahead of the hand of cut of toner image support from the reference mark for the alignment of a toner image. By setting with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which dashes the tip of a transfer paper and changes spacing of the reference mark for the alignment of a toner image, and the 2nd reference mark into a standby condition to a transfer paper After forming a color picture in a middle imprint belt, while being able to imprint the secondary color picture to a transfer paper immediately Transfer paper feeding timing can be set up easily.

[0033] Furthermore, control when imprinting the color picture formed in the time of imprinting a toner image to toner image support and toner image support to a transfer paper can be simplified more by forming the 2nd mark sensor which detects the reference mark of toner image support in a different location from the 1st mark sensor which detects the reference mark of toner image support and outputs the reference signal of the alignment of the toner image of toner image support, and sets transfer paper feeding timing to it.

[0034] Moreover, transfer paper feeding timing can be easily set up by setting with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which dashes the tip of a transfer paper and changes spacing of the 1st mark sensor and the 2nd mark sensor into a standby condition to a transfer paper.

[0035] Furthermore, by having the mode which switches the image formed in the time of imprinting the image formed in the photo conductor in the field passing speed of toner image support to toner image support, and toner image support in the time of imprinting to a transfer paper, also when imprinting to special transfer papers, such as pasteboard, a good image can be formed quickly.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] After imprinting the toner image to the middle imprint object as mentioned above, when the rate of a middle imprint object is changed, If the timing which imprints the toner image imprinted on the middle imprint object on the basis of detection of the mark for [which was prepared in the middle imprint object] alignment to a transfer paper is determined After imprinting a toner image on a middle imprint object from a photo conductor, before imprinting the toner image imprinted by the middle imprint object to a transfer paper, it is necessary to make an excess rotate a middle imprint object once, and to detect the mark for the alignment of a middle imprint object. Thus, in order to rotate a middle imprint object too much, the printing number of sheets per unit time amount will fall. Moreover, if a middle imprint object is rotated too much, contact to the toner image and photo conductor which were imprinted on the middle imprint object increases, and image degradation may be caused.

[0007] furthermore -- although he is trying to switch the rate of a middle imprint object after the back end of a toner image is imprinted by the middle imprint object from a photo conductor -- the timing -- after changing the linear velocity of a middle imprint object depending on how, time amount will be taken to mark detection, and the printing number of sheets per unit time amount will fall as a result. Moreover, although the toner image of two regions is imprinted on a middle imprint object and improvement in the printing number of sheets per unit time amount is aimed at when the size of an image is smaller than criteria size, for example, A4 size Even if it changes a rate immediately after the image back end of the 2nd side was imprinted by the middle imprint object The image tip of the 1st side will need to pass through the imprint location to a transfer paper on a layout, it will be necessary to rotate a middle imprint object by about 1 rotation the rate after a rate switch, and the printing number of sheets per unit time amount will fall [the part].

[0008] This invention cancels this demerit, and the degree of **, after switching, it aims a middle imprint object at obtaining the image formation equipment which can imprint the toner image immediately imprinted by the middle imprint object to a transfer paper, and can improve the printing number of sheets per unit time amount.

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MEANS

[Means for Solving the Problem] The image formation equipment concerning this invention imprints one sheet or the color picture for two or more sheets with the alignment of each color at toner image support based on detection of the reference mark in which the color picture by which sequential formation was carried out was prepared by toner image support to a photo conductor. One sheet or the color picture for two or more sheets imprinted by toner image support is imprinted to a transfer paper, respectively. It is image formation equipment which fixes to a transfer paper the color picture imprinted by the transfer paper, and is characterized by defining transfer paper feeding timing based on detection of the 2nd reference mark prepared in a different location from the reference mark for the alignment of the toner image of the above-mentioned toner image support.

[0010] It is good to set with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which the 2nd reference mark of the above is prepared ahead of the hand of cut of toner image support from the reference mark for the alignment of a toner image, and dashes the tip of a transfer paper and changes spacing of the reference mark for the alignment of a toner image, and the 2nd reference mark into a standby condition to a transfer paper.

[0011] Moreover, other image formation equipments concerning this invention imprint one sheet or the color picture for two or more sheets with the alignment of each color at toner image support based on detection of the reference mark in which the color picture by which sequential formation was carried out was prepared by toner image support to a photo conductor. One sheet or the color picture for two or more sheets imprinted by toner image support is imprinted to a transfer paper, respectively. It is image formation equipment which fixes to a transfer paper the color picture imprinted by the transfer paper. It is characterized by forming the 2nd mark sensor which detects the reference mark of toner image support in a different location from the 1st mark sensor which detects the reference mark of the above-mentioned toner image support, and outputs the reference signal of the alignment of the toner image of toner image support, and sets transfer paper feeding timing to it.

[0012] It is good to set with the distance to the location which imprints the toner image imprinted by toner image support from feed *****-** which dashes the tip of a transfer paper and changes spacing of the 1st mark sensor of the above, and the 2nd mark sensor into a standby condition to a transfer paper.

[0013] Moreover, the above-mentioned image formation equipment has the mode which switches the image formed in the time of imprinting the image formed in the photo conductor in the field passing speed of the above-mentioned toner image support to toner image support, and toner image support in the time of imprinting to a transfer paper.

[0014]

[Embodiment of the Invention] The image formation equipment of this invention fixes to a transfer paper the color picture which imprinted 1 or the color picture for two or more sheets which imprinted 1 or the color picture for two or more sheets to the middle imprint belt with the alignment of each color based on the reference mark in which the color picture by which sequential formation was carried out was prepared by the photo conductor at the middle imprint

belt, and was imprinted by the middle imprint belt to the transfer paper, respectively, and was imprinted by the transfer paper. To a middle imprint belt, it has the 2nd reference mark prepared ahead of the hand of cut of a middle imprint belt from the reference mark which carries out alignment of each color. It becomes the criteria of the transfer paper feeding timing for carrying out alignment of the tip of the toner image when imprinting the toner image with which the time of a mark sensor detecting this 2nd reference mark was imprinted by the middle imprint belt to a transfer paper, and a transfer paper. Spacing of the reference mark which carries out alignment of each color, and the 2nd reference mark is defined according to the distance to the location which imprints the toner image imprinted by the middle imprint belt from feed *****--** which dashes the tip of a transfer paper and is changed into a standby condition to a transfer paper.

[0015] And after forming 1 or the color picture for two or more sheets in a middle imprint belt, based on detection of the 2nd reference mark first detected with a mark sensor, paper is fed to a transfer paper, and the secondary color picture formed in the middle imprint belt is imprinted to a transfer paper. Thus, after forming a color picture in a middle imprint belt, the secondary color picture is immediately imprinted to a transfer paper, without rotating a middle imprint belt too much.

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EXAMPLE

[Example] Drawing 1 is the block diagram of one example of this invention. As shown in drawing, the printer section 1 which performs image formation and imprint actuation of image formation equipment has a photo conductor 2, the revolver unit 3, the imprint unit 4, and the write-in unit 5. The electric discharge lamp 6, the electrification charger 7, the revolver unit 3, the toner coating weight sensor 8, the electric discharge lamp 9 before an imprint, the imprint unit 4, and drum chestnut-NINGUBU 10 are formed along the hand of cut of a photo conductor 2. The revolver unit 3 has black (K), cyanogen (C), a Magenta (M), and the yellow development counters 31, 32, 33, and 34 and the yellow (Y) revolver home-position sensor 35 of each color. The imprint unit 4 has the middle imprint belt 41 and the belt imprint charger 43 which are wound around two or more rollers about, and have two reference marks 42A and 42B, the mark sensor 44 which reads reference marks 42A and 42B, the paper imprint charger 45, and the belt chestnut-NINGU section 46. The middle imprint belt 41 has the perimeter twice the die length of the photo conductor 2 which applied two sheets and transfer paper spacing of A4 horizontal size, and can form the image of two screens now in the middle imprint belt 41 in the same color by two rotations of a photo conductor 2. Reference mark 42A prepared in this middle imprint belt 41 becomes the criteria when imprinting in piles the toner image of each color formed in the photo conductor 2 to the middle imprint belt 41. Reference mark 42B prepared ahead of the hand of cut of the middle imprint belt 41 from reference mark 42A becomes the criteria of the transfer paper feeding timing for carrying out alignment of the tip of a toner image and a transfer paper, when imprinting the toner image imprinted by the middle imprint belt 41 to a transfer paper. Spacing of this reference mark 42A and reference mark 42B is defined according to the distance to the location which imprints the toner image imprinted by the middle imprint belt 41 to a transfer paper with the paper imprint charger 45 from feed *****-** 12 which dashes the tip of a transfer paper and is changed into a standby condition.

[0017] As shown in the block diagram of drawing 2, in the control section of image formation equipment, it has the printer control section 100, the scanner control section 200, the feed control section 300, and the sorter control section 400, and image formation imprint processing, image reading processing, feed processing, manuscript conveyance processing, and classification processing are performed by control of the system control section 500 to it.

[0018] The printer control section 100 has the IO controller 107 which writes in with CPU101, ROM102 and RAM103, and the serial communication controller 104, and performs a control unit 105, the laser light source control unit 106, and input/output control. CPU101 the drum motor 111 which drives the Maine motor 110 and photo conductor 2 which drive a paper conveyance system according to the control program memorized beforehand to ROM102, and the middle imprint belt 41, the development motor 112 which drives a development sleeve, and the revolver unit 3 The revolver motor 113 to drive, the supply motor 114 which supplies a toner, the fixing unit 160, and a power supply section 170 are made to drive. The revolver home-position sensor circuit 151 connected to the mark sensor circuit 150 connected to the mark sensor 44, or the revolver home-position sensor 35, the electrometer circuit 180 which measures the potential of the photo conductor 2 charged with the electrification charger 7 And actuation of the printer section 1 whole is controlled by the signal from the toner coating weight sensor circuit 181

connected to the toner coating weight sensor 8. The serial communication controller 104 controls transfer of control information or image data between the scanner control section 200, the feed control section 300, the sorter control section 400, and the system control section 500. It connects with the laser light source control unit 106 and the polygon motor 115, and the write-in control unit 105 performs exposure control of image data.

[0019] The image formation equipment formed as mentioned above explains the actuation when forming the full color image of the manuscript of one sheet of for example, B4 size or A4 size in transfer papers, such as pasteboard, with reference to the timing diagram of drawing 3.

[0020] If an image formation cycle is started, CPU101 of the printer control section 100 will turn ON the electric discharge lamp 6, will rotate the drum motor 111, will rotate a photo conductor 2 counterclockwise, and will rotate the middle imprint belt 41 clockwise with the same linear velocity V1 as a photo conductor 2. Photo conductor 2 front face discharged by rotation of this photo conductor 2 with the electric discharge lamp 6 is uniformly charged with the electrification charger 7. On the other hand, if the middle imprint belt 41 rotates and a mark sensor 44 detects 2nd reference mark 42A succeeding to the first reference mark 42B, the scanning initiation command of the black (K) image of one amorous glance will be sent to the scanner control section 200. The scanner control section 200 reads the image of the manuscript set to the scanner, and sends it to the write-in unit 5. The write-in unit 5 exposes a photo conductor 2 according to the black image K1 of the manuscript read by the scanner control section 200, and forms the electrostatic latent image of the black image K1. The electrostatic latent image of the black image K1 formed in the photo conductor 2 is visualized in the revolver unit 3. The 1st order of this visualized black image K1 is imprinted with the belt imprint charger 43 to the middle imprint belt 41 to the timing on the basis of detection of reference mark 42A of the middle imprint belt 41 by the mark sensor 44. After the secondary imprint of the black image K1 of one amorous glance is completed, the revolver unit 3 is rotated by the development motor 112, and the development counter 32 of cyanogen (C) is contacted to a photo conductor 2. Then, the primary cyanogen image C1 which formed and formed the cyanogen image C1 in the photo conductor 2 like the above is imprinted to the middle imprint belt 41 to the timing on the basis of reference mark 42A detection of the middle imprint belt 41, and the black image K1 of one amorous glance and the cyanogen image C1 of two amorous glance are piled up. This image formation and a primary imprint are repeated for every image of a Magenta (M) and yellow (Y), and as shown in drawing 4, a color picture FC1 is formed in the middle imprint belt 41.

[0021] If a color picture FC1 disappears from the point of contact of a photo conductor 2 and the middle imprint belt 41 as a primary imprint ends the yellow image Y1 which hits the last color at this image formation and primary imprint processes to the middle imprint belt 41 and it is shown in drawing 4, CPU101 will slow down the rotational speed of the drum motor 111, and will make linear velocity V1 of a photo conductor 2 and the middle imprint belt 41 one half of the linear velocity V2. If moderation of the rotational speed of the drum motor 111 is started, after fixed time amount, the middle imprint belt 41 will become linear velocity V2, and will be stabilized. If a mark sensor 44 detects reference mark 42B of the beginning of the middle imprint belt 41 after slowing down the drive rate of the middle imprint belt 41 to linear velocity V2 When CPU101 detects reference mark 42B Timing is taken and the feed resist roller 12 is rotated so that the tip of the transfer paper which sets on criteria, is sent from the color picture FC1 and the feed section 11 on the middle imprint belt 41, dashes a tip against feed *****-** 12, and is in the standby condition may suit. A transfer paper Delivery, A transfer paper is made to imprint the secondary color picture FC1. The transfer paper which imprinted the color picture FC1 is conveyed by the fixing unit 160 with the conveyance means 13, and it is fixed to it.

[0022] Thus, since paper is fed to a transfer paper based on detection of reference mark 42B first detected with a mark sensor 44 after forming the color picture FC1 of a manuscript in the middle imprint belt 41 and the secondary color picture FC1 is imprinted, after forming the color picture FC1 of the manuscript of the 1st sheet in the middle imprint belt 41, the secondary color picture FC1 can be immediately imprinted to a transfer paper, without rotating the middle imprint belt 41 too much.

[0023] When a secondary imprint is completed, the toner which the belt cleaning section 46 was

contacted to the middle imprint belt 41, and carried out the residue to the middle imprint belt 41 is removed, and it goes into the image formation of the following manuscript, and primary imprint processes.

[0024] Next, the actuation when forming the full color image of the manuscript for two sheets of A4 horizontal size in a transfer paper, for example is explained with reference to the timing diagram of drawing 5.

[0025] An image formation cycle is started, and if the middle imprint belt 41 rotates and a mark sensor 44 detects 2nd reference mark 42A succeeding to the first reference mark 42B, the scanning initiation command of the black (K) image of one amorous glance will be sent to the scanner control section 200. The scanner control section 200 reads the image of the 1st sheet of the manuscript of two sheets set to the scanner, and sends it to the write-in unit 5. The write-in unit 5 exposes a photo conductor 2 according to the black image K1 of the manuscript of the 1st sheet read by the scanner control section 200, and forms the electrostatic latent image of the black image K1. The electrostatic latent image of the black image K1 formed in the photo conductor 2 is visualized in the revolver unit 3. The 1st order of this visualized black image K1 is imprinted with the belt imprint charger 43 to the middle imprint belt 41 to the timing on the basis of detection of reference mark 42A of the middle imprint belt 41 by the mark sensor 44. After the read of the manuscript of the 1st sheet is completed, only the time amount corresponding to the time interval which conveys the transfer paper of the manuscript of the 1st sheet and the transfer paper of the manuscript of the 2nd sheet stands by by SUKYANAHO-MUPOJISHON until it carries out the return of the scanner at high speed and the manuscript of the 2nd sheet carries out reading initiation. Then, the primary black image K2 which formed the black image K2 of the manuscript of the 2nd sheet in the photo conductor 2 like the above, and was formed in the photo conductor 2 is imprinted to the field after the field which imprinted the black image K1 of the middle imprint belt 41. After the secondary imprint of the black images K1 and K2 of one amorous glance is completed, the revolver unit 3 is rotated by the development motor 112, and the development counter 32 of cyanogen (C) is contacted to a photo conductor 2. Then, the primary cyanogen image C1 which formed and formed the cyanogen image C1 of the manuscript of the 1st sheet in the photo conductor 2 like the above is imprinted to the middle imprint belt 41 to the timing on the basis of reference mark 42A detection of the middle imprint belt 41, and the black image K1 of one amorous glance and the cyanogen image C1 of two amorous glance are piled up. Then, the cyanogen image C2 of the manuscript of the 2nd sheet is formed in a photo conductor 2, and the primary formed cyanogen image C2 is imprinted to the middle imprint belt 41, and is laid on top of it with the black image K2. This image formation and a primary imprint are repeated for every image of a Magenta (M) and yellow (Y), as shown in drawing 6, after forming the color picture FC1 of the manuscript of the 1st sheet in the middle imprint belt 41, the yellow image Y2 of the manuscript of the 2nd sheet which hits the last color at image formation and primary imprint processes is imprinted, and the color picture FC2 of the manuscript of the 2nd sheet is formed.

[0026] If a primary imprint ends the yellow image Y2 of the manuscript of the 2nd sheet which hits the last color at this image formation and primary imprint processes to the middle imprint belt 31 and it goes into secondary imprint processes After CPU101 slows down the rotational speed of the drum motor 111 and slows down the linear velocity V1 of a photo conductor 2 and the middle imprint belt 41 to one half of the linear velocity V2 When a mark sensor 44 detects reference mark 42B of the beginning of the middle imprint belt 41, timing is taken on the basis of the time of detecting reference mark 42B, the feed resist roller 12 is rotated, and delivery and a transfer paper are made to imprint the secondary color picture FC1 for a transfer paper. The fixing unit 160 is conveyed and fixed to the transfer paper which imprinted the color picture FC1 with the conveyance means 13. If the secondary color picture FC1 is imprinted, the secondary color picture FC2 of the manuscript of the 2nd sheet will be succeedingly imprinted to a transfer paper, and it will be established. Moreover, when a secondary imprint is completed, the toner which the belt cleaning section 46 was contacted to the middle imprint belt 41, and carried out the residue to the middle imprint belt 41 is removed, and it goes into the image formation of the manuscript of the 3rd sheet, and the manuscript of the 4th sheet, and primary imprint processes.

[0027] Thus, since the color picture of the manuscript of the 2nd sheet is succeedingly formed in the middle imprint belt 41 at the color picture FC1 of the manuscript of the 1st sheet, the print speed per unit time amount can be improved.

[0028] The above-mentioned example forms two reference marks 42A and 42B in the middle imprint belt 41. The toner image of each color formed in the photo conductor 2 in detection of one reference mark 42A is made into the criteria when imprinting in piles to the middle imprint belt 41. Although the case where the toner image imprinted by the middle imprint belt 41 in detection of reference mark 42B of another side was made into the criteria of the transfer paper feeding timing when imprinting to a transfer paper was explained You may make it two mark sensors 44A and 44B detect one reference mark 42 prepared in the middle imprint belt 41, as shown in drawing 7 . In this case, what is necessary is to make the toner image of each color formed in the photo conductor 2 in the time of detecting a reference mark 42 by mark sensor 44A into the criteria when imprinting in piles to the middle imprint belt 41, and just to make the toner image imprinted by the middle imprint belt 41 in the time of detecting a reference mark 42 by mark sensor 44B into the criteria of the transfer paper feeding timing when imprinting to a transfer paper, as shown in the timing diagram of drawing 8 .

[0029] Moreover, although the case where slowed down the linear velocity V1 of the middle imprint belt 41 to one half of the linear velocity V2, and a toner image was imprinted to a transfer paper was explained after imprinting the toner image to the middle imprint belt 41 in order that the above-mentioned example might ***** an image to transfer papers, such as pasteboard The transfer paper of a regular paper is used, and when imprinting a toner image to a transfer paper without slowing down the linear velocity V1 of the middle imprint belt 41, after imprinting a toner image to the middle imprint belt 41, the print speed per unit time amount can be improved similarly.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram of the example of this invention.

[Drawing 2] It is the block diagram showing the configuration of the control section of the above-mentioned example.

[Drawing 3] It is the timing diagram which shows actuation of the above-mentioned example.

[Drawing 4] It is the block diagram showing the color picture formed in the middle imprint belt.

[Drawing 5] It is the timing diagram which shows other actuation of the above-mentioned example.

[Drawing 6] It is the block diagram showing the color picture of two sheets formed in the middle imprint belt.

[Drawing 7] It is the block diagram of the 2nd example of this invention.

[Drawing 8] It is the timing diagram which shows actuation of the 2nd example.

[Description of Notations]

1 Printer Section

2 Photo Conductor

3 Revolver Unit

4 Imprint Unit

5 Write-in Unit

12 Feed *****-**

41 Middle Imprint Belt

42 Reference Mark

43 Belt Imprint Charger

44 Mark Sensor

45 Paper Imprint Charger

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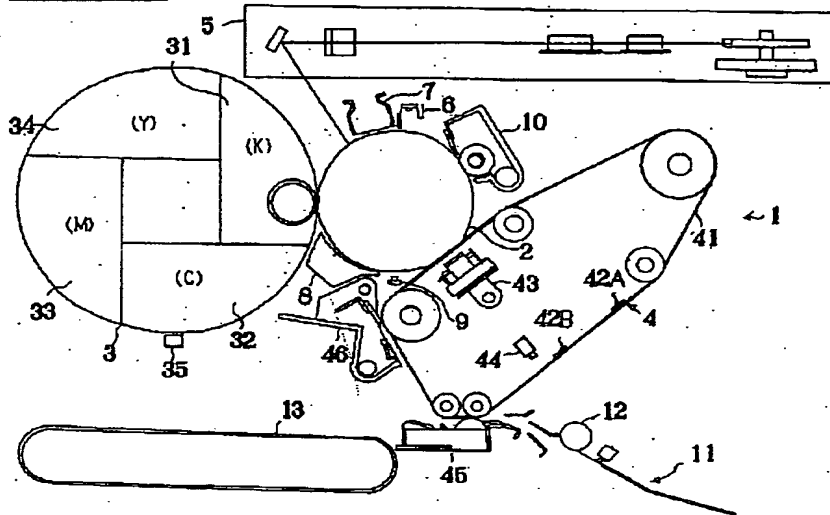
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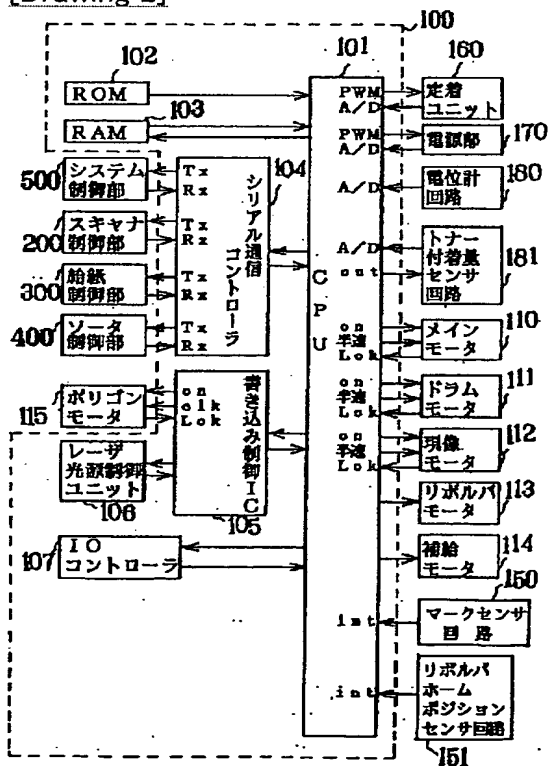
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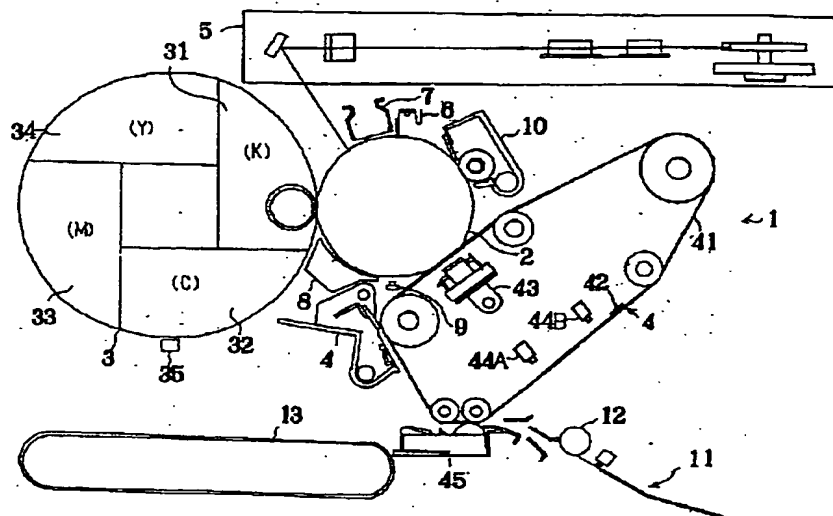
DRAWINGS

[Drawing 1]

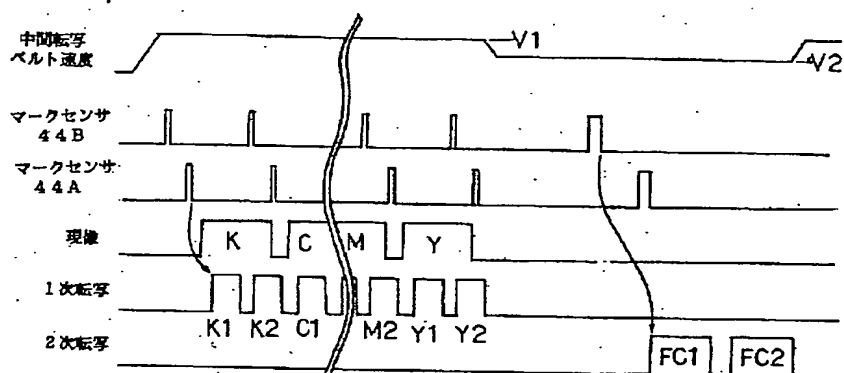


[Drawing 2]





[Drawing 8]



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